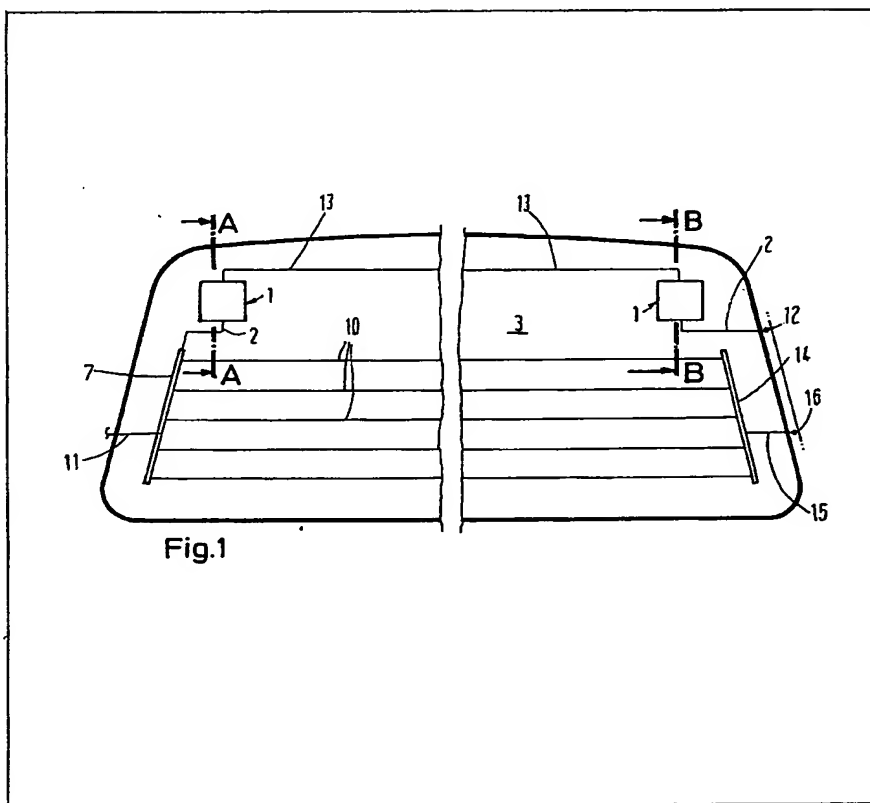


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**(54) A signal lamp set; more particularly for use in a vehicle**

(57) A signal lamp set, more particularly for use in a vehicle, consisting of at least one signal lamp (1) and a current supply lead (2), the signal lamp being constructed from optoelectronic components assembled to form a plate unit, which is secured to a pane (3), for example on the inside of a vehicle window, or in a laminated window unit.



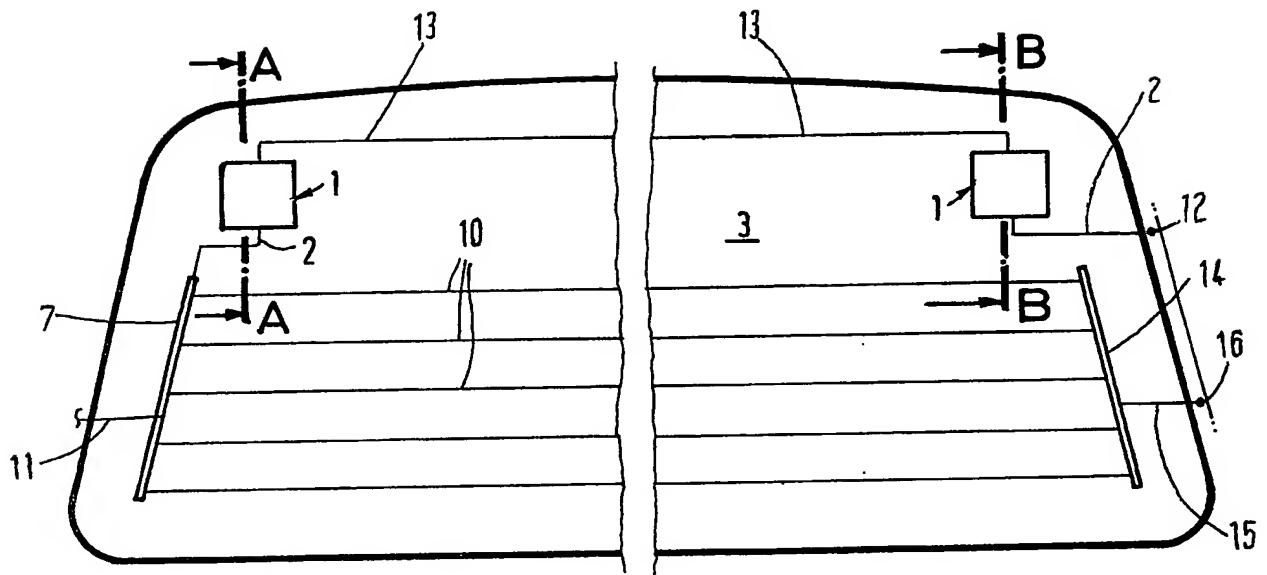


Fig. 1

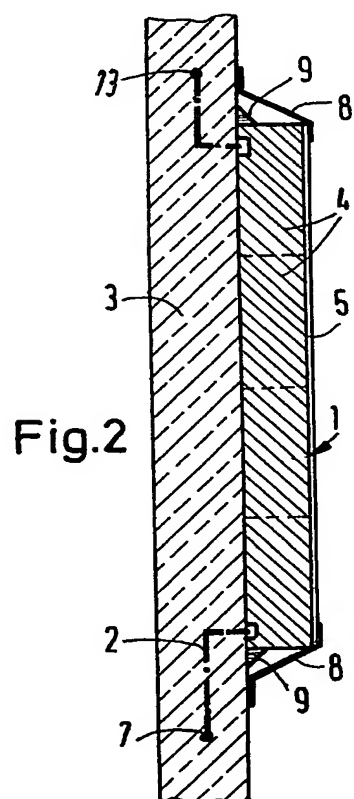


Fig. 2

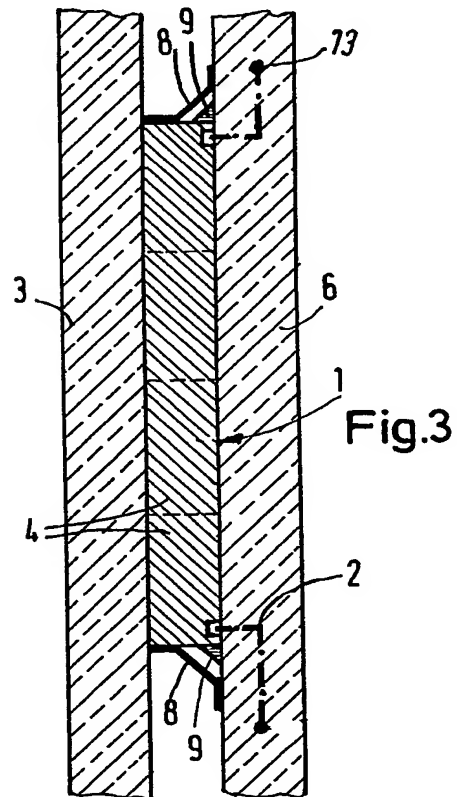


Fig. 3

## SPECIFICATION

**A signal lamp set; more particularly for use in a vehicle**

5 This invention relates to a signal lamp set, more particularly for use in a vehicle, consisting of at least one signal lamp and a current supply lead. The signal lamp can have any function, but more particularly serves as a brake warning lamp for a vehicle. However, the signal lamp can alternatively function as a vehicle spacing closing signal, a blinker for direction indicators or a hazard warning lamp, e.g. for "Accident" or "Breakdown" or to indicate "Doctor". The term "signal lamp set" covers sets having a plurality of signal lamps with similar or differing functions. The singular is used in describing the invention for simple terminological convenience. The current supply lead is a component of the signal lamp set to which the usual current supply cable end terminal can be connected. The signal lamp set can be mounted anywhere on a vehicle. However, it can alternatively be attached to a vehicle window. The term "vehicle window" covers any of the windows, but is more particularly relevant to the rear window. One known signal lamp set of this type (DE-OS 30 17 405, Claim 5), which is secured to a vehicle window, uses a conventional lamp comprising a housing, an incandescent bulb, a reflecting mirror if required and a coverglass. The weight of such signal lamps is often substantial and it is correspondingly expensive to secure them to vehicle windows. This may explain why vehicle signal lamp sets are usually mounted in a mudguard, the tailboard or the bumper, where - unfortunately - they are exposed to corrosion effects. Safe mounting at these points is also impossible. For other purposes, viz., to communicate instrument readings to the vehicle rather than give signals to other road users, it is known (US-PS 33 17 906) to sandwich instruments between two panes of glass or mount them between the faces of a bonded glass unit, or again to use a vehicle window as it were as a projection screen for instrument readings, by the application of photosensitive substances. Similarly, it is also known (DE-AS 2242 316) to work with liquid-crystal elements located in or on the vehicle windscreen. None of this has hitherto affected the problems of the simplification and safe mounting of vehicle signal lamp sets. So-called optoelectronic components are known in other fields of technology. Optoelectronic components have the property of emitting electromagnetic radiation, which can be within the visible spectrum, when supplied with current. The luminescence diode is a typical case in point. More particularly, so-called multiplex systems provide another example. Optoelectronic elements can also be printed on to a substrate, for example a sheet of glass or synthetic plastics. Optoelectronic devices are different from the liquid crystals referred to earlier. Liquid crystals are crystalline or mesomorphic liquids. The term "liquid crystal" denotes structures intermediate in their degree of ordering between an isotropic liquid and a crystal. Ordering can be influenced by electrical potentials, and different degrees of ordering

produce different reflection and adsorption characteristics. Optoelectronic components have not hitherto contributed to the problems initially described in relation to vehicle signal lamps and signal lamp sets.

The object of the invention is to provide a signal lamp set that is suitable for mounting on a vehicle where it is no longer exposed to corrosion effects.

According to the present invention, a signal lamp set having a signal lamp and a current supply lead has the signal lamp constructed from optoelectronic components, assembled to form a plate unit which is united to a pane of glass or synthetic plastic. The pane serves to protect the plate unit from the weather etc. The plate unit may be secured to the inside of a vehicle window. In principle, there are various ways of securing the plate to a window. A preferred embodiment of the invention, leading to a signal lamp set of high functional reliability, has the plate unit bonded adhesively to the window, for example using a solder or an adhesive. According to another proposal of the invention, the plate may have locking members which can be connected to locking members on the window. It is also within the scope of the invention to place over the plate unit a second pane of glass or synthetic plastic, for example combining it with the vehicle window, to form a laminate. It can also be inserted in a laminated window unit of glass or synthetic plastic, from which the current supply lead is brought out.

In principle, any method can be used within the scope of the invention for supplying current to the current supply lead of the signal lamp set. If for example the optoelectronic components are mounted near the edge of a vehicle window, cables connected to the current supply lead can also be run along the edge of the window. However, it is preferred for the current supply lead of the plate unit to be connected to a terminal which is united with a vehicle window or in a laminated window. In this way, the wiring to a heater already provided in any case in or on a vehicle window can also be used to supply current to the optoelectronic components.

The accruing advantages are to be seen in that the signal lamp set of the invention need no longer be exposed to corrosion risks. The signal lamp in the signal lamp set of the invention is integrated with a pane, since the signal lamp is a plate-shaped unit which can readily be integrated with the pane and can even be completely encapsulated in a laminated window unit. If the optoelectronic components forming the signal lamp are mounted on the inside of a vehicle window, they are still as it were located in the safety of the vehicle interior. It is obvious that the assembly comprising the pane and the plate can be provided with sealing means.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying diagrammatic drawings, in which:-

*Figure 1* is an elevation of the inside of a vehicle rear window incorporating a signal lamp set in accordance with the invention;

*Figure 2* is a section through a signal lamp set in accordance with the invention, and which may be,

for example, a section taken on the line A-A of Figure 1 to a much larger scale; and

Figure 3 is a similar section through another embodiment, and which may be, for example, a section taken on the line B-B of Figure 1.

The signal lamp set shown in Figure 1 is attached to a vehicle window. It consists of two signal lamps 1, current supply leads 2 and the vehicle window 3 itself. Each signal lamp 1 is secured on the vehicle window 3.

As shown more particularly by Figures 2 and 3, each signal lamp is a plate unit constructed from a plurality of optoelectronic components 4 secured to a pane 3 or to a pane 6 forming with the pane 3 a laminated unit.

Considering Figure 2 as a section taken on the line A-A of Figure 1, the plate unit 1 would be exposed to the inside of the vehicle except that it is provided with its own plate-shaped cover 5. The current supply lead 2 of the plate unit 1 is connected to a terminal 7 within the pane 3, which terminal 7 in Figure 1 is shown as one terminal for heater wiring 10 supplied with current by a lead 11. Plastics strips 8 are applied over the joint areas at the edges of the plate unit 1, to hide the adhesive or solder 9 from direct view, and at the same time isolate the heater wiring integral with the pane 3 from the plate unit 1.

Figure 3 shows an embodiment with a second pane 6 of glass or synthetic plastic placed over the plate unit 1, and considered as a section on the line B-B of Figure 1 is on the inside, in the same manner as commonly used in laminated vehicle windows. The supply lead 2 of the plate unit 1 is connected to a terminal 12 (Figure 1) for a switch (not shown) for the signal lamp set, a lead 13 being provided, within the pane 3 or the pane 6, to connect the two plate units 1 together in circuit. The plastics strips 8 in Figure 3 also serve to protect the adhesive or solder 9 against ultraviolet rays.

Figure 1 also shows another terminal 14 for the heater wiring 10, with a lead 15 to a terminal 16 for a switch (also not shown) for the heater.

The invention is particularly advantageous for hatchbacks and other vehicles which are fitted with large rear windows or all-glass tailboards. It is evident that purely from a circuitry viewpoint for a multiple display a multiplex harness can be used (cf. Enzyklopadie Naturwissenschaft und Technik, 1980, pp. 2112 and 2919).

## CLAIMS

1. A signal lamp set consisting of at least one signal lamp and a current supply lead, the signal lamp being constructed from optoelectronic components assembled to form a plate unit which is united to a pane of glass or synthetic plastic.

2. A signal lamp set as in Claim 1, wherein the signal lamp plate unit is secured to the inside of a vehicle window.

3. A signal lamp set as in Claim 1 or Claim 2, wherein the plate unit is adhesively bonded to the pane.

4. A signal lamp set as in Claim 1 or Claim 2, wherein the plate unit has locking members which

can be connected to locking members on the pane.

5. A signal lamp set as in any one of Claims 1 to 4, wherein over the plate unit there is placed a second pane of glass or plastic, to form a laminate.

6. A signal lamp set as in Claim 1, wherein the plate unit is inserted in a laminated window unit of glass or synthetic plastic, from which the current supply lead is brought out.

7. A signal lamp set as in any one of Claims 1 to 6, wherein the current supply lead of the plate unit is connected to a terminal which is united with the vehicle window or in a laminated window.

8. A signal lamp set substantially as hereinbefore described with reference to Figure 2 or Figure 3 of the accompanying drawings.

9. A vehicle window provided with a signal lamp set and substantially as hereinbefore described with reference to Figure 1 of the accompanying drawings in combination with Figure 2 or Figure 3 of the accompanying drawings.

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